

Amendments to the claims

Listing of Claims

1. (Previously presented) An isolated polynucleotide encoding a multifunctional germacrene-D synthase, wherein the synthase comprises an amino acid sequence with at least 60% similarity to SEQ ID NO:2.
2. (Original) An isolated polynucleotide having the sequence of SEQ ID NO:1 or a fragment or variant thereof encoding a polypeptide with multifunctional germacrene-D synthase activity.
3. (Currently amended) A polynucleotide as claimed in ~~claim 1~~ or claim 2 wherein the polynucleotide is capable of facilitating the conversion of FDP to a mixture of germacrene-D and one or more other sesquiterpenes selected from *delta*-cadinene, *delta*-elemene, elemol, *gamma*-muurolene, *gamma*-cadinene, *gamma*-elemene and germacrene-B.
4. (Original) An isolated polynucleotide as claimed in claim 3 wherein the sequence has at least 60% identity to the nucleotide sequence of SEQ ID NO:1.
5. (Original) An isolated polynucleotide as claimed in claim 3 wherein the sequence has at least 90% identity to the nucleotide sequence of SEQ ID NO:1.
6. (Original) An isolated polynucleotide as claimed in claim 3 wherein the sequence has at least 95% identity to the nucleotide sequence of SEQ ID NO:1.
7. (Original) An isolated polynucleotide as claimed in claim 3 wherein the nucleotide sequence is that of SEQ ID NO:1.
8. (Original) An isolated polynucleotide encoding the polypeptide of SEQ ID NO:2 or encoding a variant or a fragment of that sequence which has a multifunctional germacrene-D synthase activity.

9. (Original) An isolated polynucleotide as claimed in claim 8 wherein the polypeptide has at least 60% identity with the amino acid sequence of SEQ ID NO:2.
10. (Original) An isolated polynucleotide as claimed in claim 8 wherein the polypeptide has at least 90% identity with the amino acid sequence of SEQ ID NO:2.
11. (Original) An isolated polynucleotide as claimed in claim 8 wherein the polypeptide has at least 95% identity with the amino acid sequence of SEQ ID NO:2.
12. (Original) An isolated polynucleotide as claimed in claim 8 wherein the polypeptide has the sequence of SEQ ID NO:2.
13. (Previously presented) An isolated multifunctional germacrene-D synthase polypeptide comprising an amino acid sequence with at least 60% similarity to SEQ ID NO:2.
14. (Original) An isolated multifunctional germacrene-D synthase having the sequence of SEQ ID NO:2 or a fragment or variant thereof with multifunctional germacrene-D synthase activity.
15. (Original) An isolated multifunctional germacrene-D synthase as claimed in claim 14 wherein the amino acid sequence has at least 60% identity with the sequence of SEQ ID NO:2.
16. (Original) An isolated multifunctional germacrene-D synthase as claimed in claim 14 wherein the amino acid sequence has at least 90% identity with the sequence of SEQ ID NO:2.
17. (Original) An isolated multifunctional germacrene-D synthase as claimed in claim 14 wherein the amino acid sequence has at least 95% identity with the sequence of SEQ ID NO:2.

18. (Original) An isolated multifunctional germacrene-D synthase as claimed in claim 14 wherein the amino acid sequence is a mature sequence derived from SEQ ID NO:2.
19. (Currently amended) A genetic construct comprising a polynucleotide of ~~any one of claims~~ claim 1 ~~to 12~~.
20. (Currently amended) A genetic construct comprising an open reading frame polynucleotide encoding a polypeptide of ~~any one of claims~~ claim 13 ~~to 18~~.
21. (Original) A genetic construct as claimed in claim 20 further comprising a promoter sequence.
22. (Original) A genetic construct as claimed in claim 21 which further comprises a termination sequence.
23. (Original) A genetic construct as claimed in claim 22 wherein the sequence of the encoded polypeptide has the amino acid sequence of SEQ ID NO:2 or a fragment thereof with multifunctional germacrene-D activity.
24. (Currently amended) A genetic construct comprising in the 5'-3' direction a polynucleotide which hybridizes to a polynucleotide encoding a polypeptide of ~~any one of claims~~ claim 13 ~~to 18~~.
25. (Original) A genetic construct as claimed in claim 24 further comprising a promoter sequence.
26. (Original) A genetic construct as claimed in claim 25 which comprises a termination sequence.

27. (Original) A genetic construct as claimed in claim 26 wherein the sequence of the encoded polypeptide has the amino acid sequence of SEQ ID NO:2 or a fragment thereof with multifunctional germacrene-D activity.

28. (Currently amended) A vector comprising a genetic construct of ~~any one of claims~~ claim 19 to 27.

29. (Currently amended) A host cell comprising a genetic construct of ~~any one of claims~~ claim 19 to 27.

30. (Currently amended) A transgenic plant cell which includes a genetic construct of ~~any one of claims~~ claim 19 to 27.

31. (Original) A transgenic plant comprising a plant cell as claimed in claim 30.

32. (Currently amended) A method of preparing germacrene-D, *delta*-cadinene, *gamma*-cadinene, *gamma*-muurolene, *gamma*-elemene, *delta*-elemene, elemol or germacrene B comprising the steps of:

(a) culturing a cell which has been genetically modified with a polynucleotide ~~any one of claims 1-12 of claim 1~~ to provide increased multifunctional germacrene-D synthase activity;

(b) providing the cell with farnesyl diphosphate or geranyl diphosphate if necessary; and

(c) separating the germacrene-D and/or *delta*-cadinene and/or *delta*-elemene and/or elemol and/or germacrene B, and/or *gamma*-cadinene, and/or *gamma*-muurolene, and/or *gamma*-elemene produced.

33. (Previously presented) A method for modulating the Germacrene-D and/or *delta*-cadinene and/or germacrene B and or elemol and/or *delta*-elemene, and/or *gamma*-cadinene, and/or *gamma*-muurolene, and/or *gamma*-elemene production of a plant, the method comprising: increasing the or decreasing expression of multifunctional germacrene-D synthase wherein said increasing or decreasing is

achieved by genetic modification to alter the expression of a gene encoding a multifunctional germacrene-D synthase, wherein the synthase comprises an amino acid sequence with at least 60% similarity to SEQ ID NO:2.

34. A method as claimed in claim 33 wherein the synthase comprises a synthase with the sequence of SEQ ID NO:2.

35. (Currently amended) A method for modulating germacrene-D and/or *delta*-cadinene and/or germacrene B and/or elemol and/or *delta*-elemene, and/or *gamma*-cadinene, and/or *gamma*-muurolene, and/or *gamma*-elemene production in a plant, the method comprising of:

- (a) introducing into the plant, a genetic construct of ~~claims 19-27~~ claim 19;
and
- (b) transcriptionally expressing the polynucleotide in the plant.

36. (Currently amended) A method for modulating germacrene-D and/or *delta*-cadinene and/or germacrene B and or elemol and/or *delta*-elemene, and/or *gamma*-cadinene, and/or *gamma*-muurolene, and/or *gamma*-elemene production in a plant, the method comprising of:

- (a) introducing into the plant, a DNA genetic construct of ~~claims 19-27~~ claim 19; and
- (b) expressing the polypeptide in the plant.

37. (Previously presented) A polynucleotide fragment of SEQ ID NO:1 comprising at least 15 contiguous nucleotides.

38. (Currently amended) A method of selecting a plant with altered germacrene-D and/or *delta*-cadinene and/or germacrene B and or elemol and/or *delta*-elemene, and/or *gamma*-cadinene, and/or *gamma*-muurolene, and/or *gamma*-elemene content comprising the steps of:

- (a) contacting polynucleotides from at least one plant with at least one polynucleotide comprising at least 15 contiguous nucleotides of the

polynucleotide of claim 1 to assess the expression of multifunctional germacrene-D synthase; and

(b) selecting a plant showing altered expression.

39. (Original) A method as claimed in claim 38 wherein the polynucleotide has at least 15 contiguous nucleotides from a sequence selected from SEQ ID NO:1, SEQ ID NO:3, SEQ ID NO:4 and SEQ ID NO:7 and the plant is a plant of the genus *Actinidia*.

40. (Original) A method as claimed in claim 38 wherein the plant is a plant of the genus *Vaccinium*.

41. (Currently amended) A method for preparing a sesquiterpene comprising:

(a) obtaining a polypeptide as claimed in ~~any one of claims 13-18~~ claim 13; and

(b) incubating farnesyl diphosphate in the presence of the polypeptide; and

(c) separating the germacrene-D and/or *delta*-cadinene and/or germacrene B and or elemol and/or *delta*-elemene, and/or *gamma*-cadinene, and/or *gamma*-muurolene, and/or *gamma*-elemene produced.

42. (Original) A method as claimed in claim 41 wherein the products of step (b) are trapped in a matrix providing an acid environment.

43. (Original) A method as claimed in claim 42 wherein the matrix is a silica base matrix.

44. (Original) A method as claimed in claim 41 wherein the sesquiterpene is germacrene D.